Paper No. 24

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PAUL A. HOSIER, SCOTT L. TEWINKLE
and JAGDISH C. TANDON

Appeal No. 2003-0089
Application No. 08/976,474

HEARD: MAY 13, 2003

Before FLEMING, DIXON and SAADAT, Administrative Patent Judges.
SAADAT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the Examiner's final rejection of claims 1-6, which are all of the claims pending in this application.

We reverse.

BACKGROUND

Appellants' invention relates to an image sensor device having an array of photodiodes, each producing a certain amount of charge in response to light impinging thereon. During the read out cycle, the generated charges may accumulate in a diode and result in "blooming," which is the spread of excess charges

to a neighboring diode (specification, page 2). Appellants provide for a "spillover protection device" as an anti-blooming device which removes the excess charges and stops blooming. On the other hand, in order for the photodiode to operate in a linear range, a predetermined bias charge is periodically injected on the photodiode (specification, page 6). However, according to Appellants, the spillover protection device should be momentarily disabled so as not to interfere with the injection of a bias charge during the read out (specification, page 9).

Representative independent claim 1 is reproduced below:

1. A photosensitive apparatus, comprising:

a photodiode;

a transfer circuit associated with the photodiode, for transferring a signal from the photodiode to an output line; and

a spillover protection device, independently controllable relative to the transfer circuit, for applying a potential to the photodiode in response to a spillover condition in which a charge on the photodiode exceeds a predetermined threshold; and

clocking means for providing, within each cycle of operation, an integration period in which charge generated by the photodiode is integrated to yield a signal related to light impinging on the photodiode, and an inactive period wherein light impinging on the photodiode is not integrated to yield a signal, and causing the transfer circuit to periodically inject a predetermined bias charge on the photodiode during the inactive period of each cycle of operation, the clocking means further disabling the spillover protection device while the predetermined bias charge is injected on the photodiode.

The Examiner relies on the following reference in rejection the claims:

Ohba et al.(Ohba) 4,267,469 May 12, 1981

Claims 1-6 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Ohba.

Rather than reiterate the viewpoints of the Examiner and Appellants, we refer to the answer (Paper No. 17, mailed April 9, 2002) for the Examiner's complete reasoning in support of the rejection, and to the brief (Paper No. 16, filed December 13, 2001) and the reply brief (Paper No. 18, filed June 17, 2002) for Appellants' arguments thereagainst.

OPINION

The focus of Appellants' arguments is that Ohba does not disclose disabling a spillover protection device while a bias charge is placed on the photodiode (brief, page 6). Appellants point out that the equivalent of the claimed "spillover protection device" must be the "clamping circuit 21" in Ohba which return the potential on the photodiode to a known constant voltage (brief, page 7). Appellants, however, argue that there is no disclosure in Ohba indicating that the clamping circuit is disabled during the injection step (id.). Appellants further point to the higher activation voltage of the clamping circuit

compared to that of the charge injection and state that there is no reason for disabling the clamping circuit during the charge injection (brief, page 8 and reply brief, page 3).

In response to Appellants' arguments, the Examiner asserts that "the clamping circuit (21) remains in an inoperable state until a certain voltage (9V) is reached" and therefore, does not perform the spillover protection function (answer, pages 5 & 6). The Examiner further characterizes clocks Φ_1 and Φ_2 as control signals for transfer of charge and asserts that they cause the clamping circuit to remain off until a certain voltage level is applied (answer, page 6).

A rejection for anticipation under section 102 requires that the four corners of a single prior art document describe every element of the claimed invention, either expressly or inherently, such that a person of ordinary skill in the art could practice the invention without undue experimentation. See Atlas Powder Co. v. Ireco Inc., 190 F.3d 1342, 1347, 51 USPQ2d 1943, 1947 (Fed. Cir. 1999); In re Paulsen, 30 F.3d 1475, 1478-79, 31 USPQ2d 1671, 1673 (Fed. Cir. 1994).

After reviewing Ohba, we agree with Appellants' assertion that the reference includes no teaching or suggestion related to disabling the clamping circuit during the charge injection on the

photodiodes. We find that Ohba provides for clamping circuit 21 positioned between the photodiode and a vertical scanning line in an array of photodiodes of an imaging device (column 3, lines 39-45). The clamping circuit is not in its conductive state until the vertical scanning line V3 reaches a high potential of 9V during which the photodiode is reset or precharged (col. 4, lines 36-48). In order to remove the excess charges in case of intense incoming light, the potential of the vertical scanning line is set at 1V which, in turn, clamps the photodiode to the difference between the vertical line potential and the threshold voltage of the clamping circuit (col. 5, lines 7-20). However, the Examiner points to no specific reference in Ohba related to the clocking means or the step for disabling the clamping circuit while the bias charge is injected on the photodiode, nor can we find such teachings in the reference.

Additionally, in contrast to the Examiner's assertion and different from the claimed disabling of the spillover protection device, Ohba uses the same circuit element 21 for resetting or precharging the photodiode (col. 4, line 40) and removing the excess charges to prevent blooming (col. 5, lines 14-17). Furthermore, we find nothing in Ohba that positively recites disabling of circuit element 21 during the charge injection step

when the photodiode is precharged. In fact, the Examiner has incorrectly identified clocks Φ_1 and Φ_2 as control signals for transfer of charge which cause the clamping circuit to remain off until a certain voltage (9V) is reached. These clock signals are actually two-phase clock pulses applied to the transfer gate circuits (col. 3, lines 65-67) and have nothing to do with disabling of clamping circuit 21. Additionally, the Examiner's reference to the potential on the vertical scanning line or the photodiode that causes clamping circuit 21 be placed in its conductive or non-conductive state, falls short of the claimed "disabling of the spillover protection device while the predetermined bias charge is injected on the photodiode." In that regard, as argued by Appellants (brief, pages 7 & 8 and oral hearing), the clamping circuit of Ohba plays no role during the charge injection on the photodiode and affords no need to be disabled. Accordingly, because the claimed disabling of the spillover protection device is not taught by Ohba, the prior art does not anticipate the claims and the 35 U.S.C. § 102 rejection of claims 1-6 cannot be sustained.

CONCLUSION

In view of the foregoing, the decision of the Examiner rejecting claims 1-6 under 35 U.S.C. § 102 is reversed.

REVERSED

MICHAEL R. FLEMING Administrative Patent Judge	)	
JOSEPH L. DIXON Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
MAHSHID D. SAADAT Administrative Patent Judge	)	

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